Upholstery part, in particular for equipping the interior of a motor vehicle, method for producing said part and seat

Description

The invention relates to an upholstery part, in particular for the seat of a motor vehicle, with a foam body and a protective layer arranged at least in partial regions of its surface, a method suitable for producing an upholstery part and also a seat equipped with such an upholstery part, in particular a vehicle seat.

Prior art

An upholstery part of the generic type is known from the document DE 44 38 018 A1. The aircraft seat disclosed there is equipped with a seat padding which is provided on its underside with a protective layer similar to a woven fabric and, according to a special embodiment, with an additional intermediate layer of a knitted fabric, mesh or gauze. These layers serve the purpose of protecting the upholstery part during use of the seat, under the associated mechanical loads, from being damaged by the metallic supporting structure of the seat or a spring core located in the upholstery.

In the cited documentational prior art, the protective layer is bonded to the upholstery part by means of adhering locations arranged at a distance from one another. It is also known from the practical production of motor vehicle seats to insert prefabricated blanks of woven fabric into the foaming mold and bond them to the upholstery part by foam encapsulation.

Both methods lead to a usable result, but are very labor-intensive.

Problem

The invention is based on the problem of providing an upholstery part whose surface is protected against mechanical damage and which can be produced with reduced effort.

Solution

The problem is solved according to the invention in the case of an upholstery part of the generic type by the protective layer containing a material which can be applied as a liquid and cured.

The protective layer is preferably arranged on partial regions of the upholstery part that are subjected to frictional loading, in particular facing the metal structure of a seat, where the protective effect is particularly important. The foam body as such advantageously consists of an open-cell polymer foam, in particular polyurethane, which is conducive for climatically comfortable sitting. Since the protective layer is advantageously applied to the foam body only partially and not on the surface facing the occupant of the seat, the climatic sitting conditions are largely unaffected.

The protective layer preferably contains a polymer, in particular a radically polymerizable polymer. Particularly suited is a polyvinyl acetate (PVA), which can be applied as a liquid with a viscosity of 0.1 to 1.0 Pa s/20°C. To improve the abrasion characteristics, the protective layer may also contain fibers, in particular of polyamide or glass, which advantageously comprise pieces of fiber, preferably

with a length of 10 to 100 mm, with preference 25 to 75 mm, in particular approximately 50 mm, and are arranged substantially randomly in the protective layer. The fiber content in the protective layer is in this case 5 to 20% by weight, in particular approximately 10% by weight. It is generally adequate if the protective layer has a greatest thickness of 0.05 to 0.5 mm, with preference 0.1 to 0.25 mm.

By contrast with the embodiments known from the prior art, a protective layer of this type can be applied to the relevant surfaces of the upholstery part in an automated manner.

Likewise solving the defined problem, a method for producing an upholstery part in which a foamable compound is filled into a mold, the compound is made to foam to form a molded part and said part is subsequently demolded is characterized in that the upholstery part is provided at least in partial regions of its surface with a protective layer of a curable material that can be applied in liquid form.

The curable material is in this case applied, in particular sprayed, onto at least a partial region of the mold surface, preferably before the foamable compound is introduced, and/or to the molded part after the foaming of the compound.

In this case, fibers, in particular pieces of fiber, may be added to the curable material, the fibers advantageously being fed as continuous strands (rovings) to an application tool, cut there and subsequently applied as pieces of fiber.

At the same time, the curable material may be fed to the application tool in liquid form, which material

fixes the fibers or pieces of fiber in their position on the mold surface and/or the molded part.

The application of the curable material may take place in a number of layers, the number of layers varying from location to location. In this case, each layer may be of the same thickness, which is particularly favorable for the application, but nevertheless the resistance of the protective layer can be adapted to the local requirements. It goes without saying that it is also possible to adapt the fiber content in the protective layer correspondingly.

Figures

The figures represent an embodiment/embodiments of the invention schematically and by way of example.

Figure 1 shows an application according to the invention of a protective layer to an already preformed upholstery part of a vehicle seat.

Figure 2 shows the application of a curable liquid by a further method according to the invention.

Figure 3 shows an upholstery part produced in the way corresponding to the method that is shown in Figure 2.

In the procedure represented in Figure 1, firstly an upholstery part 1 is produced in a conventional way by making a mixture of polyol and isocyanate foam in a foaming mold and said part is demolded. In a likewise known way, by squeezing the upholstery part, the foam structure may subsequently be modified in such a way that it has substantially open cells, i.e. cells that communicate with one another.

In order to provide the upholstery part 1 with a protective layer 3 in the regions 2 on the rear side where it later comes into contact with the metal structure of the vehicle seat, an industrial robot 4 is used to move over the upholstery part 1 a nozzle 5, which is fed from a tank 8, via a hose line 6 and a pump 7, with a curable polyvinyl acetate (PVA), which can be applied as a liquid 9. The liquid penetrates into the uppermost regions of the upholstery part 1 and, after curing, forms an abrasion-resistant protective layer 3, which is permanently bonded to the upholstery part 1 and the thickness of which may be less than 0.1 mm. If locally greater thicknesses are required, they can be produced by repeated spraying of the upholstery part. If the industrial robot 4 has the appropriate capability, it is of course possible to provide not only planar areas but also three-dimensional moldings with a corresponding protective layer 3.

In the case of the method that is shown in Figure 2, before the foamable compound is introduced, the liquid 9 that later cures to form the protective layer 3 is sprayed locally into the cavity 10 of a multipart foaming mold 11, on the surface of which there forms a tacky film. By means of a conveying device 12, continuous strands of fiber (rovings) 13 are also fed to the nozzle 5 from a reel 14 via a line. In a cutting unit 15, these rovings are cut up into pieces of fiber 16 before entering the nozzle 5 and are applied together with the liquid 9. Compressed air fed into the nozzle 5 by means of a blower 17 can in this case assist the application onto the surface of the foaming mold 11. If need be, a release wax that facilitates later demolding is also applied to the surface of the cavity 10 before the curable liquid is sprayed on. If appropriate, the release wax and the

liquid 9 may be applied one after the other by the same industrial robot 4.

After the foaming mold 11 is closed, the foamable compound is filled into the cavity 10. The demolded upholstery part (Figure 3) is provided on the relevant regions 2 with the protective layer 3, in which the pieces of fiber 16 are randomly embedded. The bond between the upholstery part 1 and the protective layer 3 is adequately strong to withstand later handling for opening the cell structure.

In principle, it is of course possible to use both methods one after the other on the same upholstery part.

List of designations

1 upholstery part
2 region (contact with metal structure of the seat)
3 protective layer
4 industrial robot
5 nozzle
6 hose line
7 pump
8 tank
9 liquid
10 cavity
11 foaming mold
12 conveying device
13 strand of fibers (roving)
14 reel
15 cutting unit
16 piece of fiber
17 blower